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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/826,284	04/19/2004	Cheng-Lin Yang	3313-1161PUS1	9924
2292	7590	05/15/2006	EXAMINER	
BIRCH STEWART KOLASCH & BIRCH			PETKOVSEK, DANIEL J	
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FALLS CHURCH, VA 22040-0747			2874	

DATE MAILED: 05/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/826,284

Applicant(s)

YANG ET AL.

Examiner

Daniel J. Petkovsek

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on election filed March 7, 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 2 and 5-14 is/are pending in the application.
- 4a) Of the above claim(s) 1 and 2 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 5-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

This office action is in response to the election filed March 7, 2006. This action is based upon the amendment filed January 1, 2006, in which claim 1 was amended, claims 3 and 4 were canceled, and new claims 13 and 14 were added. Claims 1, 2, and 5-14 are pending.

Election/Restrictions

1. Claims 1 and 2 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected group, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on March 7, 2006.

2. Applicant's election with traverse of the election between groups I and II in the reply filed on March 7, 2006 is acknowledged. The traversal is on the grounds that searching and examining the two groups would not place an undue burden on the Examiner since these inventions are both in the same class. This is not found persuasive because the amendments to the claims on January 4, 2006 caused the claim scope of the groups to have patentable distinctions, that necessitated further search and consideration that would be burdensome upon the Examiner. If the Applicant would like to state on the record that there are no patentable distinctions between groups I and II, the Examiner will rejoin the non-elected group (claims 1 and 2).

The requirement is still deemed proper and is therefore made **FINAL**. As such, claims 5-14 are under examination.

3. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the

application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 5-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oh et al. U.S.P. No. 6,303,040 B1, and further in view of Nikonov U.S.P. No. 6,522,812 B1 and Xu et al. US 2003/0207215 A1.

Applicant asserts that Oh et al. U.S.P. No. 6,303,040 B1 teaches the claimed invention, but fails to teach or reasonably suggest the specific method in which the “micro” grating is formed (see Summary, page 2 of Applicant’s specification). The part that Applicant asserts is novel about the claims are the method steps, for example forming a photoresist stripe, exposing the photoresist by using laser interference, removing the photoresist, and etching to form the grating. (Independent claims 5 and 10). However, Oh et al. ‘040 teaches (column 4, lines 16-33) that conventional methods using laser light interference are well known to make fabricate optical gratings.

Nikonov U.S.P. No. 6,522,812 B1 teaches (Figs. 3 and 4; column 4, line 52 through column 5, line 33) an optical polymer waveguide/grating in which explicit patterning and etching steps in which photoresist is patterned by using two laser beam interference, and the grating is formed by etching as a result of the defined grating patterns.

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Xu et al. US 2003/0207215 A1 teaches (Fig. 35, [0280]-[0281]) specific advantages to using two-beam interference in the art of planar waveguide gratings devices, and the formation of the grating period as such. Xu et al. '215 also discloses that using this type of interference allows for the advantage of being able to change the grating period based on angles of the interference.

Since Oh et al. '040, Nikonov '812, and Xu et al. '215 are both from the same field of endeavor, the purposes disclosed by Nikonov '812 and Xu et al. '215 would have been recognized in the pertinent art of Oh et al. '040.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to recognize the improved use of fabricating the optical grating structure of Oh et al. '040 by the process steps as disclosed by the art of Nikonov '812 and Xu et al. '215 for the purpose of improving adjustability of the grating periods and for improving optical coupling as such.

Regarding claims 6, and 7, the art of Nikonov '812 and Xu et al. '215 both teach applications in which the waveguide gratings are in rib/ridge waveguide forms.

Regarding claims 9, and 12, although the prior art does not explicitly teach a range of 400 to 600 nm, since the Xu et al. '215 reference explicitly discloses that one of the advantages of using this type of laser interference is for the purpose of being able to change the grating period based upon the desired angles, a person having ordinary skill in the art at the time the invention was made would have realized a purpose of fabricating an optimum range of grating period, since it has been held that where the general conditions of a claim are disclosed in the prior art,

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discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding claims 8 and 11, although the specific etching process is not disclosed by the prior art, a person having ordinary skill in the art would have recognized using any well known form of etching, for example ICP etching. ICP etching is known in the art to improve accuracy and depth of etching in semiconductor process. Further, it is noted that Applicant has not asserted any criticality of using the specific form of etching as so claimed.

Regarding claims 13 and 14, a rib and groove for a waveguide is disclosed by the Oh et al. '040 reference (see figures).

6. Claims 5-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blomquist et al. U.S.P. No. 6,768,839 B2, and further in view of Nikonov U.S.P. No. 6,522,812 B1 and Xu et al. US 2003/0207215 A1.

Blomquist et al. '839 teaches (ABS, Fig. 4, column 2, lines 15-26, column 3, lines 50-56) a tunable filter comprising: a polymer fiber waveguide 4, a "micro" fiber grating 8 on the surface of the fiber waveguide, in which the grating is formed of a polymer material by use of a light interference beam pattern to create the grating period, in which the grating is tunable due to a heat source 10. Blomquist et al. '839 teaches the embodiment in a fiber apparatus, and does not explicitly teach a planar waveguide embodiment, in which the fabrication process differs to create the tunable filter.

However, a person having ordinary skill in the art would have recognized the similarity between fiber gratings (taught by Blomquist et al. '839) and planar waveguide gratings (as

claimed by Applicant), and the only missing disclosure would be the method in which this tunable filter device was fabricated.

Nikonov U.S.P. No. 6,522,812 B1 teaches (Figs. 3 and 4; column 4, line 52 through column 5, line 33) an optical polymer waveguide/grating in which explicit patterning and etching steps in which photoresist is patterned by using two laser beam interference, and the grating is formed by etching as a result of the defined grating patterns.

Xu et al. US 2003/0207215 A1 teaches (Fig. 35, [0280]-[0281]) specific advantages to using two-beam interference in the art of planar waveguide gratings devices, and the formation of the grating period as such. Xu et al. '215 also discloses that using this type of interference allows for the advantage of being able to change the grating period based on angles of the interference.

Since Blomquist et al. '839, Nikonov '812, and Xu et al. '215 are both from the same field of endeavor, the purposes disclosed by Nikonov '812 and Xu et al. '215 would have been recognized in the pertinent art of Oh et al. '040.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to recognize the fabrication of a planar waveguide, as opposed to a fiber waveguide of Blomquist et al. '839 by the process steps as disclosed by the art of Nikonov '812 and Xu et al. '215 for the purpose of improving adjustability of the grating periods and for improving optical coupling as such.

Regarding claims 6, and 7, the art of Nikonov '812 and Xu et al. '215 both teach applications in which the waveguide gratings are in rib/ridge waveguide forms.

Regarding claims 9, and 12, although the prior art does not explicitly teach a range of 400 to 600 nm, since the Xu et al. '215 reference explicitly discloses that one of the advantages of using this type of laser interference is for the purpose of being able to change the grating period based upon the desired angles, a person having ordinary skill in the art at the time the invention was made would have realized a purpose of fabricating an optimum range of grating period, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding claims 8 and 11, although the specific etching process is not disclosed by the prior art, a person having ordinary skill in the art would have recognized using any well known form of etching, for example ICP etching. ICP etching is known in the art to improve accuracy and depth of etching in semiconductor process. Further, it is noted that Applicant has not asserted any criticality of using the specific form of etching as so claimed.

Response to Arguments

7. Applicant's arguments filed January 4, 2006 have been fully considered but they are not persuasive. Applicant traverses the rejections to claims 5-12 (independent claims 5 and 10) by asserting that Nikonov and Xu fail to teach forming Bragg grating by etching the waveguide; and that Nikonov and Xu fail to teach etching a polymer film on and independent of the polymer waveguide. With all due respect, the examiner believes that Applicant has misconstrued the 35 U.S.C. 103(a) rejections of claims 5-12 over Oh et al. U.S.P. No. 6,303,040 B1, and further in view of Nikonov U.S.P. No. 6,522,812 B1 and Xu et al. US 2003/0207215 A1; as well as the

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rejections to claims 5-12 over Blomquist et al. U.S.P. No. 6,768,839 B2, and further in view of Nikonov U.S.P. No. 6,522,812 B1 and Xu et al. US 2003/0207215 A1.

8. The secondary references (Nikonov and Xu) were not brought in to teach the particulars that Applicant asserts they do not teach. The secondary references (Nikonov and Xu) were brought in to teach what was not explicitly taught by the primary references (Oh et al. '040 and Blomquist et al. '839). The secondary references were brought in to teach the particular two laser beam interference exposure with patterning and etching steps and how it would have been obvious to a person having ordinary skill in the art to use this type of method in forming a device as claimed. Applicant attempts to distinguish the claimed invention from the prior art (see Summary, page 2 of Applicant's specification) by using this method. The polymer film that Applicant centers the argument around (see page 8 of arguments filed January 4, 2006) was disclosed in the Oh et al. '040 reference, and is also present in the Blomquist et al. '839 reference. As such, Nikonov and Xu need not teach this (second) polymer film layer.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel J. Petkovsek whose telephone number is (571) 272-2355. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on (571) 272-2344. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Daniel Petkovsek
May 3, 2006


AKM ENAYET ULLAH
PRIMARY EXAMINER